

RECEIVED  
CENTRAL FAX CENTER

MAR 02 2009

Appn. No. 10/534,087  
Amendment dated March 2, 2009  
Reply to Office Action Dated October 30, 2008

## AMENDMENTS TO THE CLAIMS

1. (cancelled)
2. (cancelled)
3. (Currently amended) A cross-linked composite according to Claim ~~4~~ 25, wherein the ~~organic or organometallic moiety~~ functionality is a mixture of such ~~moieties~~ functionalities having a different functionality.
4. (cancelled)
5. (cancelled)
6. (Currently amended) A method according to Claim ~~4~~ 21, wherein the ~~organic or organometallic moiety~~ functionality is a mixture of such ~~moieties~~ functionalities having a different functionality.
7. (Currently amended) A multi-layer material comprising a plurality of layers of a cross-linked composite as defined in Claim 25, ~~of boronic acid or a boronic acid derivative such as a boronate, and an organic or organo-metallic moiety~~ having a functionality such as selected from hole transporting, electron transporting and light emitting, wherein each layer has a different functionality.
8. (cancelled)
9. (Previously presented). A multi-layer material according to Claim 7, having two functional layers, one functional layer having a hole transporting

Appln. No. 10/634,087  
Amendment dated March 2, 2009  
Reply to Office Action Dated October 30, 2008

functionality, and the other functional layer having a light emitting functionality and an electron transporting functionality.

10. (Previously presented) A multi-layer material according to Claim 9, wherein the layer having the hole transporting functionality comprises CzBA, and wherein the layer having the light emitting functionality and an electron transporting functionality is  $F_n$ BA, wherein  $n = 2, 3$  or  $4$ .

11. (Currently amended) A method of making a multi-layer material comprising a plurality of layers of a cross-linked composite of ~~boronic acid or a boronic acid derivative such as a boronate, and an organic or organo-metallic moiety as defined in Claim 25,~~ having a functionality such as selected from hole transporting, electron transporting and light emitting, the method comprising forming on a substrate, a layer of a composite of ~~boronic acid or a boronic acid derivative and an organic or organo-metallic moiety as defined in Claim 25,~~ having a functionality such as selected from hole transporting, electron transporting and light emitting, and cross-linking, and forming at least one another such layer having a different functionality such as hole transporting, electron transporting and light emitting and cross-linking.

12. (cancelled)

13. (Currently amended) A method according to Claim ~~11~~ 42, wherein the ~~organic or organometallic moiety~~ functionality is a mixture of such ~~moieties~~ functionalities having a different functionality.

14. (Previously presented) A method according to Claim 11, wherein said layer is formed on the substrate by spin coating from solution in an organic solvent and cross-linked, and successively forming and cross-linking said at least one another such layer.

Appl. No. 10/534,087  
Amendment dated March 2, 2009  
Reply to Office Action Dated October 30, 2008

15. (Previously presented) A method according to Claim 14, wherein the organic solvent is selected from the group consisting of THF, DMF and acetone.

16. (Currently amended) A multi-layer photoelectronic device, comprising in sequence, a transparent substrate layer, a transparent electrode layer, a layer of a transparent cross-linked composite as defined in Claim 25, ~~of boric acid or a boric acid derivative such as a boronate, and an organic or organo-metallic moiety~~ having a functionality such as hole transporting, electron transporting and light emitting, at least one another such cross-linked composite as defined in Claim 25 layer having a different functionality such as hole transporting, electron transporting and light emitting, and another electrode layer.

17. (cancelled)

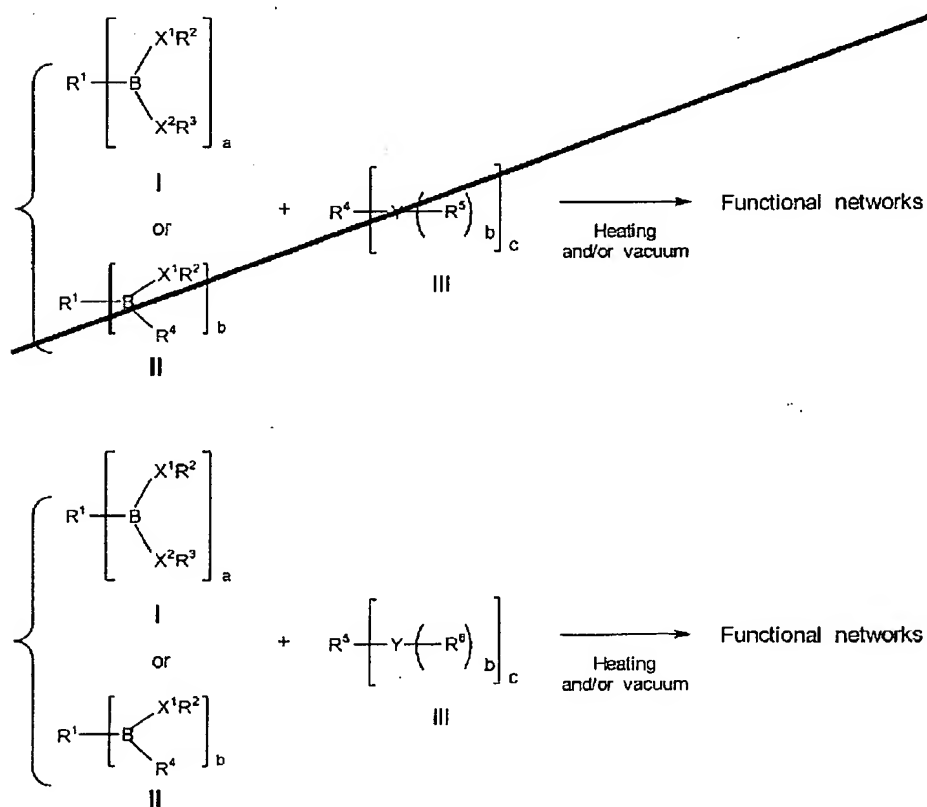
18. (Currently amended) A multi-layer photoelectronic device according to Claim ~~48-16~~, having two functional layers, one functional layer having a hole transporting functionality, and the other functional layer having a light emitting functionality and an electron transporting functionality.

19. (Currently amended) A multi-layer photoelectronic device according to Claim ~~49-18~~, wherein the layer having the hole transporting functionality comprises CzBA, and wherein the layer having the light emitting functionality and an electron transporting functionality is  $F_nBA$ , wherein  $n = 2, 3$  or  $4$ .

20. (Currently amended) A multi-layer photoelectronic device according to Claim ~~20-19~~, wherein the transparent substrate is glass, the transparent electrode is indium tin oxide and the another electrode layer is Mg:Ag.

Appln. No. 10/534,087  
 Amendment dated March 2, 2009  
 Reply to Office Action Dated October 30, 2008

21. (Currently amended) A method of making a cross-linked functional networks composite of a boronic acid of structural formula I or II (when  $R^2$  and  $R^3 = H$ ) or a boronate of structural formula I or II (when  $R^2$  and  $R^3 = \text{alkyl or aryl}$ ) having a functionality selected from hole transporting, electron transporting and light emitting and a mixture thereof, and a di- or polyols or thiols of structural formula III, comprising reacting a compound of structural formula I or structural formula II with a compound of structural formula III (as shown in figure 10), and cross-linking according to the following reaction



Appln. No. 10/534,087  
 Amendment dated March 2, 2009  
 Reply to Office Action Dated October 30, 2008

wherein,

~~R<sup>1</sup>, and R<sup>4</sup> = alkyl, aryl, or other groups, either organic or inorganic, but~~  
R<sup>1</sup>, R<sup>4</sup> and R<sup>5</sup> are alkyl or aryl, at least one of them contains containing  
a functionality;

~~they can be of small molecular weights.~~

~~R<sup>2</sup>, R<sup>3</sup>, R<sup>5</sup> = H, alkyl, aryl, they may be same or different, but at least~~  
one of them is H. R<sup>2</sup> and R<sup>3</sup> are alkyl or aryl, R<sup>5</sup> is H.

~~X<sup>1</sup>, X<sup>2</sup> = O, S, or N, they may be same or different. X<sup>1</sup> and X<sup>2</sup> are O.~~

~~Y = O, S, N (or NH), BO<sub>2</sub>, SiO<sub>2</sub>, AlO<sub>2</sub>, TiO<sub>3</sub>, etc. Y = O or S, and~~

~~a and c are larger than one.~~

~~b equal to 1, 2 or 3. a, b, and c are equal to or larger than one, but at~~  
least either a (or b) or c is larger than one.

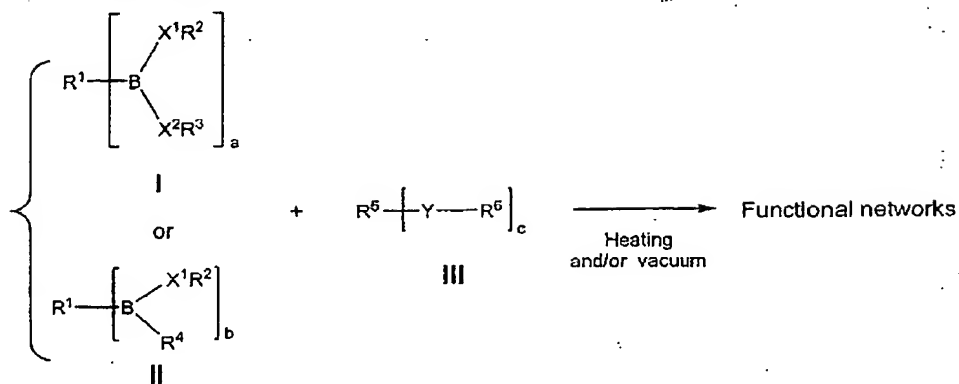
22. (Currently amended) A method according to Claim 21, ~~5, 6, 11, 12,~~  
~~13, 14, 15 or 22~~, wherein the cross-linking is effected by heating under vacuum.

23. (Currently amended) A method according to Claim ~~23~~ 22, wherein  
 heating is effected at a temperature of from room temperature up to 130 °C.

24. (Previously presented) A cross-linked functional network, made by a  
 method as claimed in Claim 22, ~~23 or 24~~.

25. (New) A cross-linked composite of a boronic acid of structural formula I  
 or a boronate of structural formula II having a functionality selected from hole  
 transporting, electron transporting and light emitting and a mixture thereof,  
 and a di-or polyol or thiol of structural formula III,

Appl. No. 10/534,087  
 Amendment dated March 2, 2009  
 Reply to Office Action Dated October 30, 2008



wherein  $\text{R}^1$ ,  $\text{R}^4$  and  $\text{R}^5$  are alkyl or aryl, at least one containing a functionality,  
 $\text{R}^2$  and  $\text{R}^3$  are H, alkyl or aryl,  
 $\text{R}^6$  is H,  
 $\text{X}^1$  and  $\text{X}^2$  are O,  
 $\text{Y}$  is O or S, and  
 $a$ ,  $b$  and  $c$  are equal to or larger than one, but at least either  $a$  (or  $b$ ), or  $c$  is larger than one.